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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,231

08/31/2006

Kei Tashiro

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9331

22852

7590

05/12/2009

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EXAMINER

BUTTNER, DAVID J

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

05/12/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,231	TASHIRO ET AL.	
	Examiner	Art Unit	
	David Buttner	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/31/06;12/14/06;3/5/07</u> . | 6) <input type="checkbox"/> Other: ____. |

Art Unit: 1796

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2 and 6-8 rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the Saito presentation at the Elastomers meeting of the Journal of the Society of Rubber Industry.

Saito reacts supercritical carbon dioxide with epoxidized natural rubber to form cyclic carbonated natural rubber. The reaction conditions (table 1) are the same as applicant.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim 1 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over SU422262.

The reference exemplifies (#2) reacting carbon dioxide with an epoxidized polyisoprene. The carbon dioxide and epoxy group produce cyclocarbonate groups (page 2 line 4 of reference). As recognized by applicant (page 6 line 28), natural rubber is primarily polyisoprene. The reference performs the same reaction as applicant and therefore would exhibit the same final structure.

Claims 1-8 rejected under 35 U.S.C. 103(a) as being unpatentable over SU422262 in view of JP2002053573.

SU422262 does not state the carbon dioxide is provided in a supercritical state.

JP2002053573 (abstract) teaches epoxy groups can be reacted with supercritical carbon dioxide to form cyclocarbonate without the need of a catalyst. It would have been obvious to carry out SU422262's CO₂/epoxy reaction under supercritical conditions in order to avoid using a catalyst. The expense of the catalyst and separation problems associated with the catalyst are therefore avoided (paragraph 2 of JP2002053573). The reaction conditions of JP200205373 include pressures of 60-90kg/cm² (paragraph 15); temperatures of 70-180⁰C (paragraph 14); times of 30 min-24 hours (paragraph 16) and dimethylformamide solvent (paragraph 12).

Note that applicant's claim 5 does not require an ionic liquid be present, but merely limits the species of ionic liquid in the markush group of claim 3.

Claims 1-8 rejected under 35 U.S.C. 103(a) as being unpatentable over SU422262 in view of the Kawanami article in Society of Chemical Engineers Japan.

SU422262 does not state the carbon dioxide is provided in a supercritical state.

Kawanami teaches epoxy groups can be reacted with supercritical carbon dioxide in the presence of ethylmethylimidazole tetrafluoroborate to form cyclocarbonate in times (eg 2 hours) much shorter than SU422262 (eg 14-20 hours). It would have been obvious to conduct the SU422262 reaction of epoxidized polyisoprene with CO₂ under supercritical conditions to hasten reaction time.

Kawanami's reaction conditions include a pressure of 6MPa and temperature of 80°C.

Note that applicant's claim 4 does not require these amide solvents be present, but merely limits the species of nonionic solvents in the larger markush group of claim 3.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Buttner whose telephone number is 571-272-1084. The examiner can normally be reached on weekdays from 10 to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jim Seidleck, can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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David Buttner

5/8/09

/David Buttner/

Primary Examiner, Art Unit 1796